

CLAIMS

1. A fiber preparation apparatus adapted to remove an outer protective coating from a fiber optic cable to expose a fiber optic cladding and core for processing in a multi-stage integrated optical component processing system, comprising:
 - a fiber optic cable cutting tool configured to cut an optical fiber;
 - a fiber optic cable stripping tool coupled to the fiber optic cable cutting tool and adapted to remove at least a portion of the fiber optic cladding and core; and
 - a fiber gripper apparatus adapted to grip the fiber optic cable to expose a segment of the fiber optic cable for processing and position the pre-defined segment of the fiber optic cable in a processing position with respect to the fiber optic cable cutting tool and fiber optic cable stripping tool.
2. The apparatus of claim 1, wherein the fiber gripper apparatus is adapted to sequentially position at least a portion of the outer protective coating of the segment of the fiber optic cable between cutting and stripping operations.
3. The apparatus of claim 2, wherein the fiber optic cable stripping tool comprises a first and second clamp members adapted to clamp the outer protective coating of the fiber optic cable therebetween.
4. The apparatus of claim 3, wherein the first clamp member further comprises a first heating element and the second clamp member further comprises a second heating element, wherein at least one of the first and second heating elements is adapted to melt the outer protective coating to expose the fiber optic cladding and core.
5. The apparatus of claim 1, wherein the fiber optic stripping tool comprises at least one heated clamp adapted to clamp around a segment of the fiber optic cable to be stripped and to heat the fiber optic protective coating therebetween.
6. The apparatus of claim 5, wherein the at least one heated clamp comprises a first heated clamp member and a second heated clamp member each adapted to

melt at least a portion of the outer protective coating to expose at least a portion of the fiber optic cladding and core.

7. The apparatus of claim 5, wherein the at least one heated clamp comprises a first heated clamp member and a second heated clamp member in slidable engagement with a rail member adapted to allow the first and second clamp members to move between a fiber clamping position and a fiber release position.

8. The apparatus of claim 7, wherein the first and second heated clamp members are selectively actuatable between the fiber clamping position and the fiber release position by a clamp drive.

9. A fiber preparation apparatus adapted to remove an outer protective coating of at least one fiber optic cable to expose a fiber optic cladding and core and cut the exposed cladding and core to a pre-determined length being processed within a multi-stage integrated optical component processing system, comprising:

a heated fiber stripping tool adapted to melt and remove the outer protective coating to expose a portion of the cladding and core;

a cutting tool coupled to the fiber stripping tool and adapted to cut the exposed cladding and core; and

an upper positioning member adapted to sequentially move the fiber stripping tool and cutting tool between a plurality of fiber optic cable stripping operations and cutting operations.

10. The apparatus of claim 9, further comprising a lower positioning member that includes a first gripper and a second gripper, the first and second grippers being adapted to hold the fiber optic cable during the plurality of stripping operations and cutting operations.

11. The apparatus of claim 9, wherein the heated fiber stripping tool comprises a first heated clamp disposed opposite a second heated clamp, the first and second heated clamps being adapted to clamp around a segment of the fiber optic cable and heat the fiber optic protective coating therebetween.

12. The apparatus of claim 11, wherein the first and second heated clamps are disposed on and in slidable engagement with a rail member adapted to allow the first and second heated clamps to move into and out of a fiber clamping position.

13. The apparatus of claim 11, wherein the first and second heated clamps comprise at least one heating element embedded in the respective first and second heated clamps.

14. A method of preparing a plurality of fiber optic cables to accept optical components thereon, comprising:

exposing a segment of at least one of the plurality of fiber optic cables for processing;

sequentially positioning the segment between a plurality of stripping operations and cutting operations;

stripping the outer protective coating of the segment to expose a portion of a fiber optic cladding and core; and

cutting the fiber optic cladding and core to a predetermined length to accept the optical component thereon.

15. The method of claim 14, wherein cutting the fiber optic cladding and core comprises cutting the segment to expose a receiving end of the fiber optic cladding and core.

16. The method of claim 14, wherein stripping the outer protective coating from the fiber optic cable comprises positioning a stripping tool adjacent the segment of the fiber optic cable and removing a portion of the outer protective coating of the fiber optic cable.

17. The method of claim 16, wherein the stripping tool comprises a first gripper member and a second gripper member, the first and second gripper members being adapted to grip the fiber optic cable therebetween.

18. The method of claim 17, wherein stripping the outer protective coating from the fiber optic cable comprises gripping the fiber optic cable between the first gripper member and the second gripper member to expose the segment of the fiber optic cable therebetween.

19. The method of claim 14, wherein stripping the outer protective coating from the fiber optic cable further comprises heating the outer protective coating.

20. The method of claim 19, wherein heating the outer protective coating comprises clamping the outer protective coating between a first and second heated clamp and heating the outer protective coating to an outer protective coating removal temperature.

21. A fiber preparation apparatus adapted to remove a portion of an outer protective coating disposed on a segment of a fiber optic cable to expose a fiber optic cladding and core, comprising:

a fiber strip/cut assembly coupled to a moveable upper positioning member;

a cutting tool coupled to the moveable upper positioning member and adapted to cut the fiber optic cable;

a stripping tool coupled to the upper positioning member and adapted to strip a portion of the outer protective coating of the fiber optic cable to expose a portion of the fiber optic cladding and core, wherein the stripping tool includes a body having a first clamping member spaced from and opposing a second clamping member wherein the first and second clamping members are adapted to move between a plurality of fiber clamping positions about the segment of the fiber optic cable; and

a moveable lower positioning member that includes a first gripper and a second gripper wherein the first and second grippers are adapted to grip and expose the segment of the fiber optic cable adjacent the fiber strip/cut assembly for processing during a stripping process or cutting processing step.

22. The apparatus of claim 21, wherein the moveable upper positioning member comprises an upper positioning motor adapted to move the stripping tool between a plurality of stripping operations.

23. The apparatus of claim 21, wherein the first and second clamping members are disposed on, and in slidable engagement with, a rail member adapted to allow the first and second clamping members to move between the plurality of fiber clamping positions.

24. The apparatus of claim 23, wherein the first and second clamping members are activated by a clamp drive adapted to move the first and second clamp members along the rail member.

25. The apparatus of claim 23, wherein the stripping tool further includes a first heating element disposed on the first clamp member and a second heating element disposed on the second clamp member.

26. The apparatus of claim 25, wherein at least one of the first and second heating elements are adapted to heat, melt, and remove a portion of the outer protective coating from the fiber optic cable segment to expose a portion of the fiber optic cladding and core.

27. The apparatus of claim 25, wherein when clamped about the fiber optic cable, the first and second heating elements move from a clamped heating position to a clamped coating removal position to remove a portion of the outer protective coating from the segment to expose a portion of the fiber optic cladding and core.

28. The apparatus of claim 27, wherein when the first and second heating elements move from the clamped heating position to the clamped coating removal position about the segment of the fiber optic cable, the first and second heating elements remove between about 250 microns to about 900 microns of the outer protective coating.

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